CLAIMS

1. A friction stir welding method for supporting an end face of a stacked assembly (6) made up of a plurality of members (W1, W2) with a support jig (10) and embedding a probe (8) of a friction stir welding tool (7) into another end face of said stacked assembly (6) to friction-stir-weld said stacked assembly (6), comprising the steps of:

providing a recess (18) in said support jig (10); and

rotating said probe (8) and embedding said probe (8) into said other end face of said stacked assembly (6) toward said recess (18) thereby to join said stacked assembly (6) over said recess (18) and to provide a land (44) projecting in the direction in which said probe (8) is embedded, on said end face of said stacked assembly (6).

2. A friction stir welding method according to claim 1, wherein said land (44) has a portion having a substantially circular horizontal cross section, and said horizontal cross section has a diameter greater than an outside diameter of said probe (8).

3. A friction stir welding support jig (10) for supporting an end face of a stacked assembly (6) made up of a plurality of members (W1, W2) when said stacked assembly (6) is friction-stir-welded, comprising

a recess (18) for accommodating therein the material of

said stacked assembly (6) which plastically flows from said end face of said stacked assembly (6) in the direction in which a probe (8) of a friction stir welding tool (7) is embedded into another end face of said stacked assembly (6) while said probe (8) is rotating.

4. A member (42) with a friction-stir-welded joint produced when a stacked assembly (6) made up of a plurality of members (W1, W2) is friction-stir-welded, comprising

a land (44) which projects from an end face of said stacked assembly (6) when a probe (8) of a friction stir welding tool (7) is embedded into another end face of said stacked assembly (6).

5. A friction stir welding method for supporting a stacked assembly (6) made up of a plurality of members (W1, W2) with a placement jig (116) which is inserted in an insertion recess (112) in a support jig (114) with a clearance (124) defined therebetween and which has a recess (132) defined in an upper end face thereof, and embedding a probe (8) of a friction stir welding tool (7) into an upper end face of said stacked assembly (6) to friction-stir-weld said stacked assembly (6), comprising the step of

displacing said support jig (114) in said insertion recess (112) in a direction to bring the center of said recess (132) of said placement jig (116) into alignment with the center of said probe (8) when said probe (8) is rotated

and embedded into the upper end face of said stacked assembly (6) toward said recess (132) of said placement jig (116) to friction-stir-weld said stacked assembly (6) over said recess (132).

6. A friction stir welding jig (110) for friction-stir-welding a stacked assembly (6) made up of a plurality of members (W1, W2), comprising:

a placement jig (116) having a recess (132) defined in an upper end face thereof, for placing said stacked assembly (6) thereon;

a support jig (114) having an insertion recess (112) defined therein for inserting said placement jig (116) therein; and

an elastic body (130) interposed between said support jig (114) and a portion of said placement jig (116) which is inserted in said insertion recess (112) with a clearance (124) defined therebetween.

7. A friction stir welding tool (210) for friction-stir-welding abutting portions of a plurality of metal workpieces (W1, W2), comprising:

a rotor (216) for pressing said workpieces (W1, W2); and

a probe (218) disposed coaxially on a tip end of said rotor (216), for being inserted into said workpieces (W1, W2);

said probe (218) comprising:

a first screw section (220) disposed on a tip end of said probe (218) and having a helical shape; and

a second screw section (222) disposed behind said first screw section (220) and having a helical shape oriented opposite to said first screw section (220).

8. A friction stir welding tool (210) according to claim 7, wherein said workpieces (W1, W2) are stacked together; and

the distance (H) from a boundary line (224) between said first screw section (220) and said second screw section (222) to an end face of said rotor (216) is substantially equal to the thickness of one workpiece (W2) on a face side among said workpieces (W1, W2).

9. A friction stir welding tool (210) according to claim 7, wherein said first screw section (220) and said second screw section (222) have equal screw pitches; and

said first screw section (220) and said second screw section (222) have equal axial lengths (H).

10. A friction stir welding tool (210) according to claim 7, wherein said first screw section (220) and said second screw section (222) have respective threads (220a, 222a) which are contiguous.